

NORTHWESTERN STATES PORTLAND CEMENT COMPANY

(Mason City, Iowa)

GENERAL DESCRIPTION

The Northwestern States Portland Cement Company (NWSPCC) site is located in the S 1/2 of Section 33, T97N, R20W and in the N 1/2 of the NW 1/4 of Section 4, T96N, R20W, Cerro Gordo County, Iowa. The approximately 250-acre site is located near a north side Mason City residential area. Calmus Creek flows by the site to the Winnebago River, which is less than a mile east. The owner of record is NWSPCC, which has become Holnam Inc. The site was entered on the Registry in April 1992. The EPA placed the site on the National Priorities List (NPL) in August 1990 and was subsequently de-listed from the NPL in August 1995.

SITE CLASSIFICATION

The site was classified "d" with the completion of closure activities in 1993.

TYPE AND QUANTITY OF HAZARDOUS WASTE

The NWSPCC facility has manufactured cement since 1908 in an area referred to as the West Quarry site, which was mined for limestone until 1950. From 1969 to 1985, NWSPCC used the quarry for the disposal of approximately 2,000,000 tons of waste kiln dust. When disposal activities ceased the quarry's unfilled area had been reduced to 40 acres and contained about 420 million gallons of water.

SUMMARY OF PUBLIC HEALTH AND ENVIRONMENTAL CONCERNS

NWSPCC began to monitor the pH in the quarry water in 1974 after noticing a change in color of the quarry water. From April 1974 to January 1976 the pH increased gradually (from 8.0 to 8.7) followed by a rapid increase to a pH of 11.8 by April and then leveling off at about 12.5 in 1980. In response to quarry de-watering initiated in 1987, pH levels have declined.

In 1979, two seeps emerged from the northeastern portion of the filled part of the quarry and flowed overland to Calmus Creek. During a 1984 study by the IDNR, Calmus Creek was found to have elevated pH downstream from the seeps and in April 1985, ordered NWSPCC to cease discharge from the seep area to Calmus Creek. After a September 1986 fish kill in Calmus Creek, the IDNR conducted additional stream sampling and found pH downstream from the seep area ranged 10.2 to 10.5. Elevated potassium and white residue on the streambed were also noted. In October 1986, the IDNR again ordered NWSPCC to cease discharge from the seep area.

The major health and environmental concern at NWSPCC is contaminated surface water and groundwater resulting from contact with waste cement kiln dust in the West Quarry. The kiln dust includes calcium oxide (CaO), which reacts with water and releases hydroxide ions (OH⁻) into solution. The hydroxide ion concentration directly controls the pH level in a liquid. The site has caused local groundwater and surface water to be impacted by high pH values, an increase in total dissolved solids, and elevated concentrations of potassium, sulfate, and sodium.

Impacted groundwater has been found to exist within the kiln dust fill and in the bedrock underlying and adjacent to the quarry. The degree of impact has been shown to decrease with depth and no off-site groundwater contamination has been found. However, potential pathways of groundwater migration exist via the Devonian bedrock aquifer. Nearby wells which draw from this aquifer include ten private wells about a mile north of the site and three wells in the Lime Creek Nature Preserve about a mile and a half northeast of the site. The Mason City water supply wells and other high capacity wells are completed in the deeper Cambrian Jordan Sandstone at depths greater than 1,200 feet. These deep wells are typically uncased through the Devonian aquifer.

STATUS OF ASSESSMENT, MONITORING OR REMEDIAL ACTIONS

In 1987, the EPA conducted a Site Inspection (SI) and based on the findings of the SI, was proposed for the NPL in June 1988. In June 1987, NWSPCC installed an acid treatment system adjacent to Calmus Creek. In addition to treating the seep water, the system was used to treat water being removed from the West Quarry pond. The treated water was discharged to Calmus Creek in accordance with an NPDES permit issued by the department. The discharge of water from the acid-neutralization continued to pose potential water quality problems in Calmus Creek due to its elevated levels of dissolved solids and phenols.

NWSPCC initiated a Remedial Investigation/Feasibility Study (RI/FS) in 1988. The department issued an Administrative Order to NWSPCC in September 1989 for the completion of the RI/FS. This order was replaced in December 1989 with a consent order for the same. NWSPCC completed the RI/FS in March 1990. A Record of Decision (ROD) was completed in June 1990 under state lead. The EPA then negotiated an agreement with NWSPCC for the design and construction of the remedial action prescribed in the ROD. Remedial action was initiated in 1992 and construction was completed in 1993.

The Record of Decision (ROD) for the selected remedy of waste isolation was completed in June 1990. The implementation of these remedial activities continues to be performed under the terms of the EPA Consent Decree 90-11-2-618. Isolation of the kiln dust was accomplished by the sequential implementation of the following remedial technologies:

- The West Quarry was drained in September 1989.
- Construct a permanent drain system in the floor of the de-watered quarry was completed prior to the ROD. The system is inspected on an annual basis and repaired as necessary.
- Bedrock de-watering wells were completed in 1992.
- Kiln dust monitoring wells were installed in 1992.
- An engineered cap was placed over the kiln dust in 1993. The cap is inspected on an annual basis and repaired as necessary.
- Treatment in compliance with the state NPDES permit of extracted waters prior discharge to Calmus Creek. A new treatment facility was completed in 1993.
- Quarterly groundwater monitoring for two years was required after the completion of remedial construction in October 1993. Sampling is now conducted on an annual basis.

The latest study of Calmus Creek was completed in August 1995. Based on the results, the water quality of the creek complies with the state requirements for a Class B warm-water stream. The EPA completed a five-year review of the site in 2007. The EPA concluded the remedial action has been protective and recommended continued operation and maintenance of the remedial system.